SOUTHERN PINE BEETLE

PHEROMONE TRAPPING REPORT, 2023

South Carolina
Forestry Commission

Executive summary

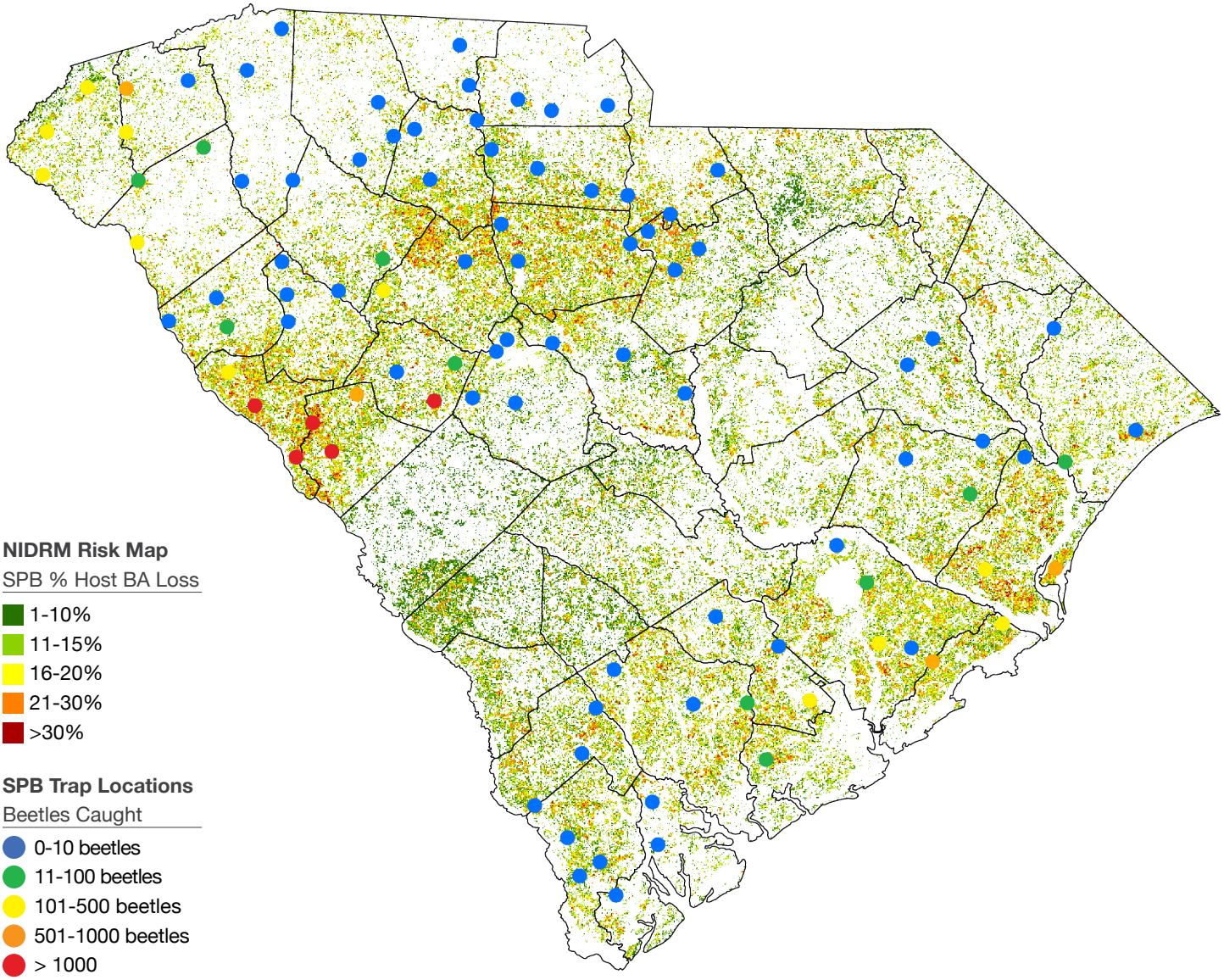
Southern pine beetle (SPB) is one of the most destructive insects to southern yellow pine. The South Carolina Forestry Commission has conducted annual spring pheromone trapping since 1986 to monitor SPB populations and predict the damage they may cause in the upcoming season. Traps were deployed in 32 counties in 2023. Based on the data from these traps, we predict increasing or high SPB activity in Edgefield and McCormick counties and static or moderate SPB activity in Charleston, Georgetown, Pickens and Saluda counties. The remainder of the state is predicted to have little significant SPB activity. SPB was reported in 66% of the counties trapped, and clerid predators have increased from the previous year. The National Weather Service predicts warmer weather and normal to increased rainfall in the region over the season. We advise monitoring stands for SPB in Edgefield, McCormick, Charleston, Georgetown, Pickens and Saluda counties. The Forest Health Division will conduct aerial surveys in these and other counties.

Introduction and methodology

A total of 32 SC counties were trapped for SPB in 2023 using revised protocol devised by Billings, et al, 2017. The previous protocol called for two attractants per trap, frontalin and alpha pinene (Sirex lure), and the revised protocol calls for a third attractant, *endo*-brevicomin, to be placed 10-12' away from the trap. Prior studies indicated the addition of the third attractant is on average 6.54X more attractive to SPB and .97X less attractive to clerid (SPB's main insect predator) when compared to using frontalin and Sirex lures alone. The protocol includes monitoring three pheromone traps in each county for a 35-day period during early spring. Insects captured in each trap are returned to the laboratory for identification and analysis. The total number of trap days and SPB and clerid beetles caught are summed for each trap. The average number of SPB caught per trap per day and percent SPB are used to predict the population trend for each county and region and for the whole state. In the past, such surveys have had a success rate of over 80% in predicting the degree of SPB infestation for the following summer.

Forestry Commission personnel placed SPB traps in 32 counties in South Carolina in 2023.

South Carolina Forestry Commission southern pine beetle trapping



Results

Based on these results, we predict SPB activity in Edgefield and McCormick counties, and for Charleston, Georgetown, Pickens and Saluda counties to experience some SPB activity, but their predictions are considered "static or moderate" on the prediction chart. The statewide and regional average predictions remain "declining or low." The statewide SPB caught per trap per day was 5.47 and made up 75% of the total catch. The number of SPB is approximately equivalent to 2022 (taking into account the increased attractiveness of the lures), which was 4.35. The proportion of clerids has remained roughly the same (79% in 2022, 75% in 2023). Piedmont counties caught 81% of the SPB and 80% of the clerid beetles. The coastal plain caught 19% of the SPB and 20% of the clerid beetles. These results are for entire counties, and there is always the possibility of sporadic and localized beetle activity in counties with overall predictions of low population levels.

Review of 2022

2022 was mild temperature-wise, and the state received moderate amounts of rain during the growing season, though the lower part of the state did experience some minor drought. There had been SPB activity in the Francis Marion National Forest, but this was mostly confined to trees subject to long periods of standing water. The Forest Service has done a great job ameliorating SPB in Francis Marion over the past year or two.

SC's 2023 bark beetle prediction

Predicting SC bark beetle activity for the summer of 2023 is based on current and predicted weather, current

drought status per region, activity in preceding years and SC's 2023 pheromone trapping data. For the 2023 summer of the southeastern U.S., the National Weather Service is predicting slightly above average temperatures and slightly above average rainfall. Most beetle activity throughout the state of SC is likely to be attributable to *Ips* and black turpentine beetles (BTB) in susceptible pine stands that are overstocked, over-mature or stagnant, have poor or excessive drainage, or have littleleaf, annosus or other root diseases causing stress. *Ips* thrive in stressed trees and high temperatures, completing their life cycle in as little as 21 days. Often, by the time you realize you have an *Ips* spot, they have completed their life cycle and have dispersed. Control tactics employed for SPB, such as "cut and leave" and "salvaging," do not work for *Ips* and BTB since both readily breed in cut pine tops, boles and stumps. During a summer thinning, we recommend all pine tops to be chipped and removed from the site or at least kept at the logging deck. For more information on either beetle, please follow this link: http://www.state.sc.us/forest/idbeetles.pdf

SC's SPB population trend

SPB activity has leveled out regionally, with SPB spots in Mississippi, Alabama and Georgia. Populations are marginally increasing in South Carolina.

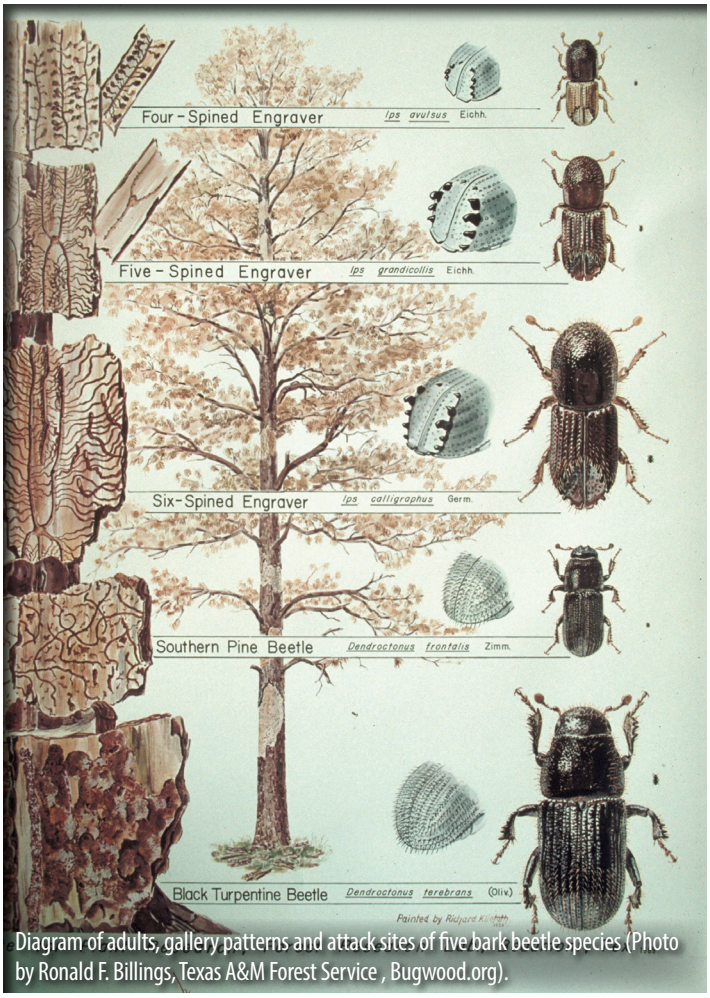
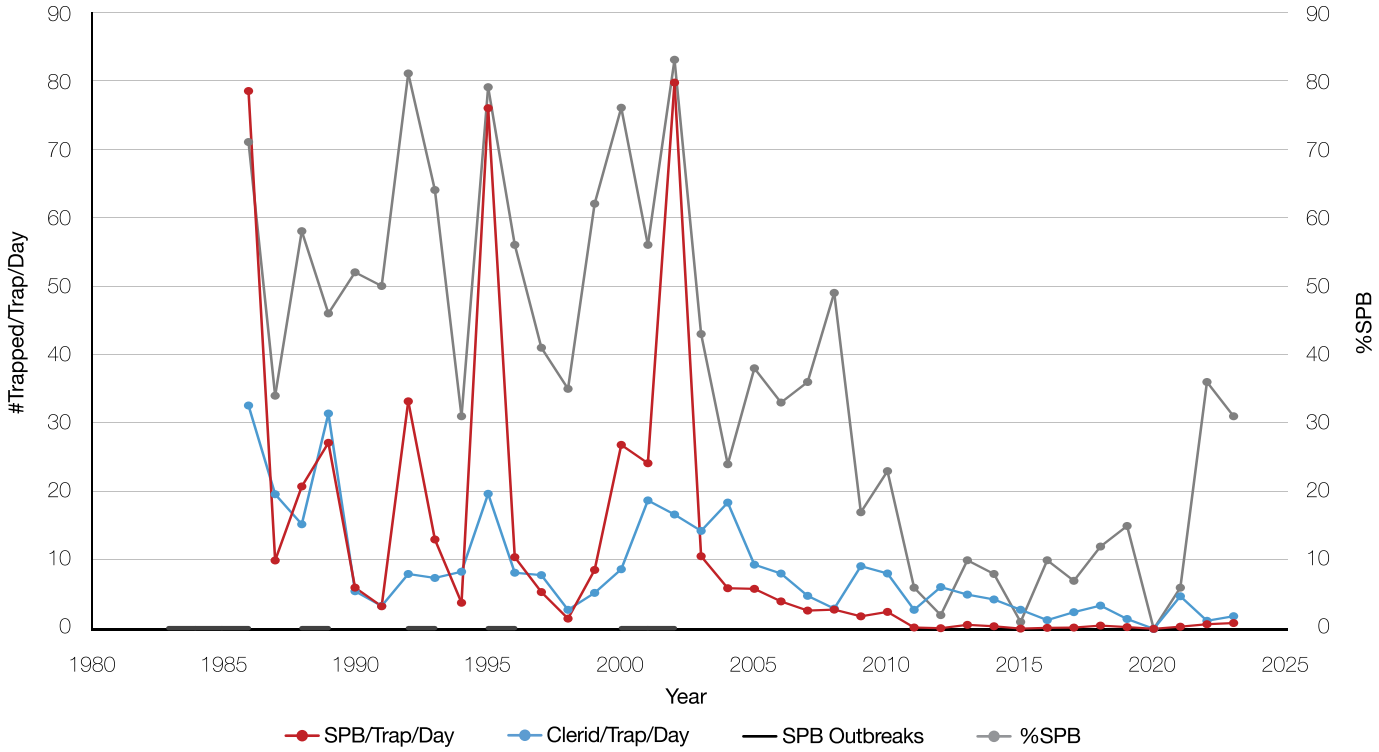


Diagram of adults, gallery patterns and attack sites of five bark beetle species (Photo by Ronald F. Billings, Texas A&M Forest Service , Bugwood.org).

SCFC's southern pine beetle trapping results 1986-2023



* Beginning in 2017 and still in continuation, *endo*-Brevicomin was added to the previous used attractants of Frontalin and Sirex. A study found this new attractant combination on average was 6.54X more attractive to SPB and .97X less attractive to Clerid. To better compare previous years to 2017 and after, the number of SPB Trapped/Trap/Day was divided by 6.54, but the number of Clerid was left the same.

Recommendations for landowners and foresters

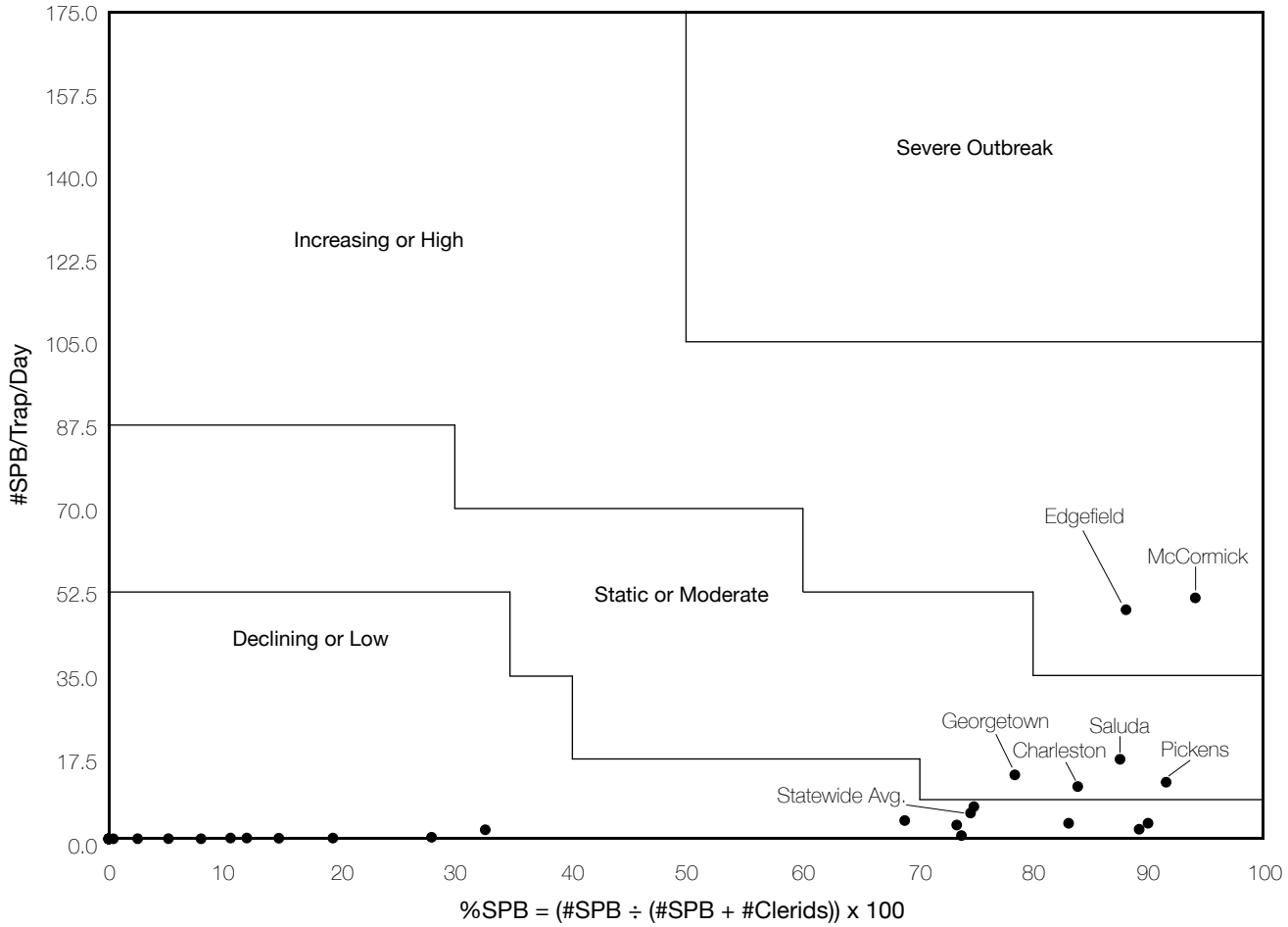
Although current SPB populations are comparatively low, we encourage foresters and forest landowners to manage for regulated forests by evenly distributing their pine acreage among age classes, thin on a timely basis and consider harvesting at-risk stands sooner. When regenerating pine stands, it is important to plant the correct species and density for the site, control natural pine regeneration or have a plan in place to address it; and consider available wood markets or lack thereof. The SPB Cost-Share Program currently has funds available for regenerating pine stands at lower densities and pre-commercial thinning young, over-dense pine stands. This program is more suited for areas and acreages outside of healthy pulpwood markets, which is where we have suffered the most loss to SPB. If interested in applying, please contact your county's SCFC project forester: https://www.scfc.gov/about-us/contacts/.

SPG embergence holes (Photo by Erich G. Vallery, USDA Forest Service - SRS-4552, Bugwood.org).

Summary

We predict that Edgefield and McCormick counties will experience SPB activity, and Charleston, Georgetown,

SCFC southern pine beetle pheromone trapping survey, 2023
SPB prediction chart: Frontalin + Sirex Lure + *endo*-Brevicomin



Pickens and Saluda counties may experience some SPB activity, with predictions in the "static or moderate" range for these counties. The statewide and regional average SPB predictions are considered "declining–low." High summer temperatures should restrict SPB dispersal in the state, and clerid populations appear to be stable. Most beetle activity within SC will mostly be attributable to *Ips* and BTB. Higher than average rainfall that is predicted by the National Weather Service may overcome high summer temperatures and reduce *Ips* and BTB activity in most counties. If you suspect bark beetle activity, please contact the SCFC for identification and the best course of action. Employing the "cut and leave" and "salvaging" techniques could lead to more pine loss if SPB is not the culprit.

It is difficult to predict the degree of loss to SPB and other bark beetles, but our best guess for SC in 2023 is for a loss between $300,000 and $500,000.

Contact the SCFC insect & disease staff

Please contact us if you have any questions or if we can provide additional information.

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Dead pines from an SPB infestation.

SCFC southern pine beetle pheromone trapping results, 2023

Severe Outbreak Prediction Trend (1)

No counties in South Carolina are predicted to have a severe outbreak in 2023.

Increasing - High Prediction Trend (2)

County	Trapping Days	#SPB	#Clerids	% SPB	SPB/Day
Edgefield	99	4806	640	88.25%	48.55
McCormick	84	4289	261	94.26%	51.06

Static - Moderate Prediction Trend (3)

County	Trapping Days	#SPB	#Clerids	% SPB	SPB/Day
Charleston	99	1097	208	84.06%	11.08
Georgetown	85	1153	314	78.60%	13.56
Pickens	85	1020	92	92%	12.00
Saluda	84	1416	136	91.24%	16.86

Declining - Low Prediction Trend (4)

County	Trapping Days	#SPB	#Clerids	% SPB	SPB/Day
Abbeville	90	15	127	10.56%	0.17
Anderson	77	299	134	69.05%	3.88
Beaufort	87	0	4	0.00%	0.00
Berkeley	105	348	38	90.16%	3.31
Cherokee	81	0	99	0.00%	0.00
Chester	84	0	122	0.00%	0.00
Colleton	78	54	19	73.97%	0.69
Dorchester	87	177	21	89.39%	2.03
Fairfield	84	0	380	0.00%	0.00
Florence	90	1	257	0.39%	0.01
Greenville	89	2	23	8.00%	0.02
Greenwood	71	9	52	14.75%	0.13
Hampton	84	0	4	0.00%	0.00
Horry	84	14	103	11.97%	0.17
Jasper	87	0	1	0.00%	0.00
Kershaw	90	0	428	0.00%	0.00
Lancaster	90	0	651	0.00%	0.00
Laurens	84	28	73	27.72%	0.33
Lexington	96	3	117	2.50%	0.03
Newberry	84	161	332	32.66%	1.92
Oconee	128	423	85	83.3%	3.30
Richland	84	0	48	0.00%	0.00
Spartanburg	81	3	55	5.17%	0.04
Union	81	0	72	0.00%	0.00
Williamsburg	89	14	58	19.44%	0.16
York	84	0	217	0.00%	0.00
State Totals	**2,805**	**15,332**	**5,171**	**75%**	**5.47**
Coastal Totals	**975**	**2,858**	**1,027**	**74%**	**2.93**
Piedmont Totals	**1,830**	**12,474**	**4,144**	**75%**	**6.82**

Severe Outbreak: High probability for major losses
Increasing - High: Greater than 100% increase from previous year
Static - Moderate: Less than a 50% decline to less than 100% increase from previous year
Declining - Low: Greater than a 50% decline from previous year